

S  
553, 28  
O I rv  
1966

PERIODICALS

# PLEASE RETURN

## Oil and Gas Conservation Commission OF THE STATE OF MONTANA

**TIM BABCOCK**

GOVERNOR



STATE DOCUMENTS COLLECTION



ANNUAL REVIEW FOR THE YEAR 1966

Relating to

## OIL AND GAS

Volume 10

AUG 24 1979

MONTANA STATE LIBRARY  
930 E Lyndale Ave.  
Helena, Montana 59601

### COMMISSIONERS

E. G. BALSAM, Chairman  
2300 Pearl, Miles City, Montana 59301

WINSTON L. COX, Vice-Chairman  
1925 Grand Ave., Billings, Montana 59102

ALLEN ZIMMERMAN  
P. O. Box 277, Poplar, Montana 59255

LYLE KASSEL  
142 Third South, Shelby, Montana 59474

CLYDE BREWER  
P. O. Box 294, Roundup, Montana 59072

Montana State Library



3 0864 1005 8967 3

# The Oil and Gas Conservation Commission of The State of Montana

## ADMINISTRATORS

JAMES F. NEELY  
EXECUTIVE SECRETARY  
JOHN H. RISKEN  
ATTORNEY  
GORDON D. LANOUETTE  
PETROLEUM ENGINEER  
BILLY B. LANE  
GEOLOGIST  
NORMAN J. BEAUDRY  
ACCOUNTANT



## COMMISSIONERS

E. G. BALSAM, CHAIRMAN  
2300 PEARL  
MILES CITY, MONTANA 59301  
WINSTON L. COX, VICE CHAIRMAN  
1925 GRAND AVENUE  
BILLINGS, MONTANA 59102  
ALLEN ZIMMERMAN  
BOX 277  
POPLAR, MONTANA 59255  
LYLE KASSEL  
142 3RD SOUTH  
SHELBY, MONTANA 59474  
CLYDE BREWER  
P. O. BOX 294  
ROUNDUP, MONTANA 59072

Administrative Office.....	325 Fuller Avenue, Helena
Northern District Field Office.....	218 Main Street, Shelby
Southern District Field and Tech. Office.....	15 Poly Drive, Billings
Sub-District Office.....	323 2nd Ave. S.E., Sidney

## Annual Review for the Year 1966

## Volume 10

### INTRODUCTION

This is the tenth Annual Review of drilling and producing operations in Montana.

Production during 1966 reached an all time high of 35,380,000 barrels as compared to the previous high of 32,778,000 barrels in 1965. Total remaining oil reserves at the end of 1966 are estimated to be 393,000,000 barrels as compared to 408,000,000 barrels a year ago.

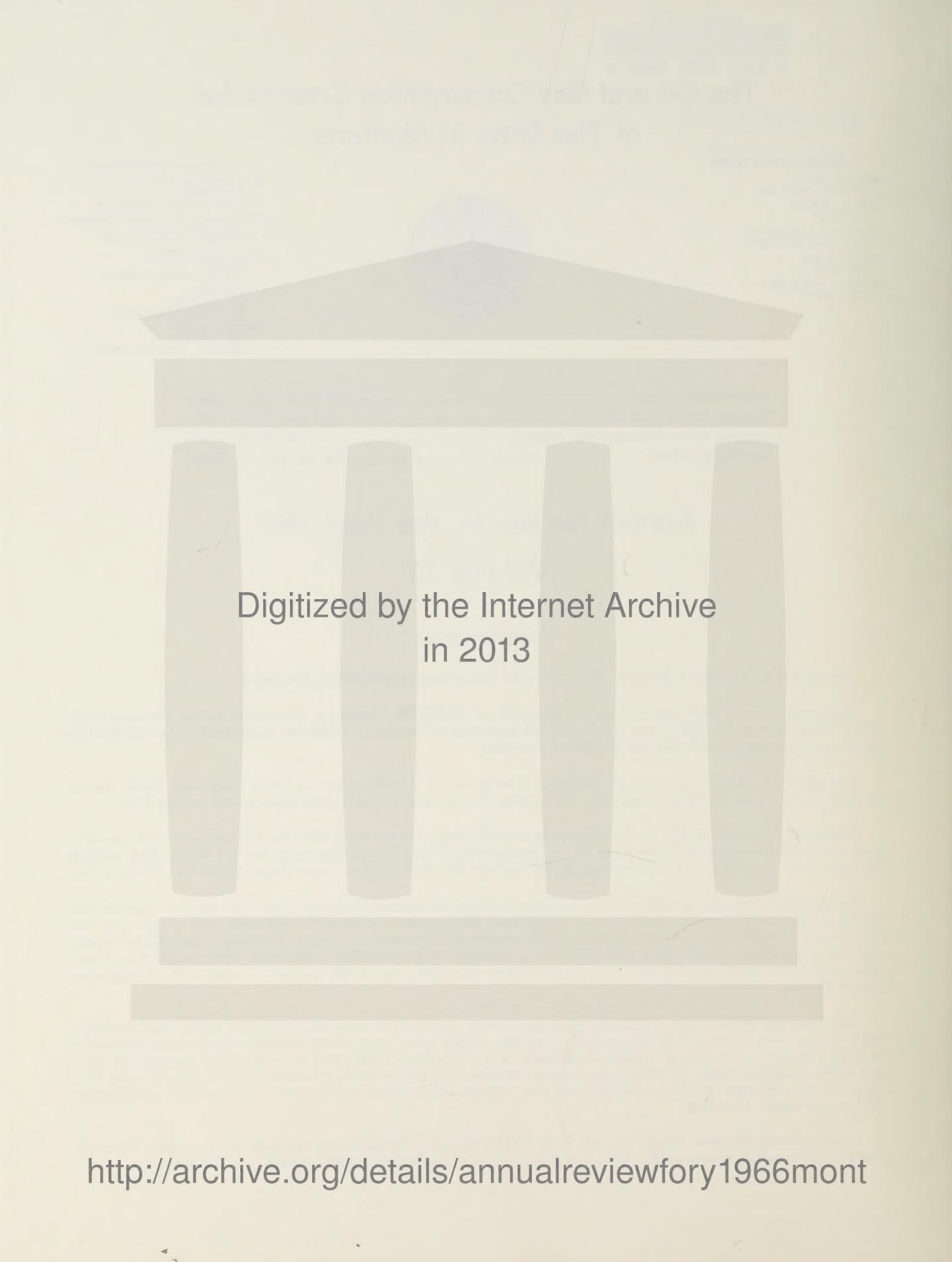
The record production rate during 1966 was due mainly to development of large reservoirs found during the past three years. Several significant discoveries but no major discoveries were made during 1966.

During 1966 a total of 482 wells were drilled in Montana. These included 198 wildcats and 284 development wells. Of the wildcats there were 10 oil discoveries, 3 gas discoveries and 185 dry holes. The wildcat dry hole ratio was 15.2 to 1. The development drilling resulted in 179 oil wells, 9 gas wells and 96 dry holes.

New fields found during 1966 include the Reserve Field in eastern Montana. This field has the deepest production in the State from the Red River at 11,100 feet. The largest discovery of reserves was a new pay discovery in the Madison in Lookout Butte Field in southeast Montana. In central Montana new fields discovered were the Weed Creek Field with Amsden production and the Kelley Field with Tyler production. There were two rather small discoveries in northwest Montana. They were the Miners Coulee and Rattlesnake Coulee Fields.

Development drilling was at almost the same record pace as during the previous year. Most development drilling was in northwest Montana. In this area there were many wells classified as development wells, because they were within the northern boundary of the Cut Bank Field, that were actually exploration wells in a large undrilled area. Development drilling continued in southeast Montana along the Cedar Creek Anticline and in northeast Montana in Flat Lake and Goose Lake. There was a small amount of development drilling in central Montana.

Four waterfloods were started during 1966 and a total of 33 waterfloods are now in operation. The Commission approved 5 waterfloods and 2 of these have commenced water injection during the year.



Digitized by the Internet Archive  
in 2013

<http://archive.org/details/annualreviewfory1966mont>

**FIVE YEAR SUMMARY**

	<b>1962</b>	<b>1963</b>	<b>1964</b>	<b>1965</b>	<b>1966</b>
Production, Northern Montana—Bbls.	4,252,304	4,530,510	5,705,948	6,826,261	7,991,302
South Central—Bbls.	3,851,672	3,383,587	3,699,927	3,597,647	3,392,890
Central—Bbls.	5,279,163	3,950,490	3,269,768	2,849,923	2,710,194
Williston Basin—Bbls.	18,264,368	19,005,066	17,971,855	19,504,287	21,285,732
<b>TOTAL</b>	<b>31,647,507</b>	<b>30,869,653</b>	<b>30,647,498</b>	<b>32,778,118</b>	<b>35,380,118</b>
No. of Producing Wells, Northern Montana					
South Central	2,615	2,550	2,216	2,649	2,308
Central	88	82	88	101	106
Williston Basin	333	310	317	306	301
<b>TOTAL</b>	<b>656</b>	<b>700</b>	<b>708</b>	<b>754</b>	<b>792</b>
Average Daily Production/Well—BOPD,					
Northern Montana	4.5	4.9	7.4	7.1	9.5
South Central	119.9	113.4	115.1	97.6	87.7
Central	43.4	34.8	28.8	25.5	24.7
Williston Basin	76.3	74.4	65.7	70.9	73.6
<b>STATE AVERAGE</b>	<b>23.5</b>	<b>23.2</b>	<b>25.2</b>	<b>23.6</b>	<b>27.6</b>
Development Wells Drilled, Oil Wells					
Gas Wells	182	131	100	177	179
Dry Holes	16	6	7	9	9
<b>TOTAL</b>	<b>57</b>	<b>60</b>	<b>109</b>	<b>107</b>	<b>96</b>
Exploratory Wells Drilled, Oil Wells					
Gas Wells	8	8	22	14	10
Dry Holes	2	5	3	1	3
<b>TOTAL</b>	<b>154</b>	<b>152</b>	<b>150</b>	<b>199</b>	<b>185</b>
TOTAL WELLS DRILLED	164	165	175	214	198
TOTAL FOOTAGE DRILLED	419	362	391	507	482
AVERAGE DEPTH OF ALL WELLS	2,415,856	1,906,976	1,863,155	2,328,865	2,211,369
	5,765	5,268	4,765	4,593	4,588

**SUMMARY OF DRILLING BY COUNTIES—1966**  
**STATE OF MONTANA**

County	Wildcats			Development			Gas	Total Wells Drilled	Footage Drilled	Avg. Depth Per Well
	Dry	Oil	Gas	Dry	Oil	Gas				
Big Horn	6	0	0	1	2	0	9	49,271	5,475	
Blaine	1	0	0	0	0	1	2	5,250	2,625	
Carbon	2	0	1	3	3	0	9	42,684	4,743	
Carter	4	0	0	0	0	0	4	10,341	2,585	
Chouteau	2	0	0	0	0	0	2	6,021	3,011	
Custer	2	0	0	0	0	2	4	21,252	5,313	
Daniels	3	0	0	0	0	0	3	29,682	9,894	
Dawson	2	0	0	0	1	6	0	9	84,399	9,378
Fallon	1	0	0	0	2	28	0	31	272,757	8,799
Garfield	5	0	0	0	0	0	5	33,111	6,622	
Glacier	11	1	0	12	37	2	63	205,135	3,256	
Hill	9	0	1	0	0	1	11	39,841	3,622	
Liberty	15	0	0	8	8	1	32	92,488	2,890	
McCone	10	0	0	2	5	0	17	116,112	6,830	
Musselshell	7	1	0	5	4	0	17	83,678	4,922	
Petroleum	1	0	0	0	1	0	2	7,898	3,949	
Phillips	2	0	0	0	0	0	2	8,175	4,088	
Pondera	5	1	0	0	12	0	18	49,748	2,764	
Powder River	3	0	2	1	4	0	6	32,722	5,454	
Prairie	1	0	0	1	1	0	5	46,653	9,331	
Richland	3	1	0	1	1	0	6	68,907	11,485	
Roosevelt	5	1	0	3	2	0	11	85,947	7,813	
Rosebud	4	0	0	6	2	0	12	60,250	5,021	
Sheridan	16	2	0	8	22	0	48	338,592	7,054	
Stillwater	2	0	0	0	0	0	2	10,055	5,028	
Sweetgrass	1	0	0	0	0	0	1	6,266	6,266	
Teton	6	0	0	1	1	0	8	18,663	2,333	
Tool	53	2	1	41	37	2	136	336,085	2,471	
Valley	2	0	0	0	0	0	2	12,142	6,071	
Wheatland	1	0	0	0	0	0	1	6,390	6,390	
Wibaux	0	0	0	0	0	0	2	18,275	9,138	
Yellowstone	0	1	0	1	0	0	2	12,579	6,290	
TOTALS	10	3	96	179	9	482	179	2,211,369	4,588	

TOTAL  
96.932

PERCENT

60.2

WILLISTON  
BASIN

9.6

7.7

NORTHERN  
MONTANA

22.5

CRUDE OIL PRODUCTION  
1942-1966

B.O.P.D. (THOUSANDS)

90

80

70

60

50

40

40

30

20

10

30

20

10

10

20

10

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

**MONTANA**  
**GAS PRODUCTION DATA — 1966**

Field	County	Producing Formation	1966 Production MCF
Big Coulee	Golden Valley & Stillwater	Lakota & Morrison	986,774
Bowdoin	Phillips & Valley	Colorado	2,148,063
Bowes	Blaine	Eagle	579,397
Cabin Creek	Fallon	Interlake & Red River	1,213,957
Cedar Creek	Fallon & Wibaux	Judith River & Eagle	3,449,124
Cut Bank & Reagan	Glacier & Toole	Cut Bank & Madison	8,253,797
Dry Creek	Carbon	Eagle & Frontier	1,072,851
Elk Basin	Carbon	Tensleep	1,572,634
Flat Coulee	Liberty	Blackleaf & Swift	81,390
Gold Butte	Toole	Swift	26,282
Grandview	Liberty	Blackleaf & Kootenai	64,439
Hardin	Big Horn	Frontier	41,005
Keith Block	Liberty	Blackleaf & Sawtooth	4,763,980
Kevin Sunburst	Toole	Kootenai	691,637
Lake Basin	Stillwater	Frontier	1,250,815
Middle Butte	Toole	Blackleaf	61,923
Mt. Lilly	Liberty	Madison	361,486
Pine	Dawson, Prairie, Fallon & Wibaux	Interlake & Red River	777,581
Plevna	Fallon	Judith River	160,400
Utopia	Liberty	Blackleaf, Kootenai & Ellis	991,782
Whitlash	Liberty	Blackleaf, Kootenai	1,882,656
Miscellaneous			1,346,174
TOTAL ALL FIELDS			31,778,147

**REFINING**

**Year, 1966  
Total Bbls.**

Big West Oil Company	765,374
Continental Oil Company	10,595,051
Diamond Asphalt Company	165,336
Farmers Union Central Exchange, Inc.	6,494,402
Humble Oil & Refining Company	11,874,704
Jet Fuel Refinery	65,937
Phillips Petroleum Company	1,619,158
Tesoro Petroleum Company	680,655
Union Oil Company	1,168,559

TOTAL Barrels Oil Refined in Montana, 1966 33,429,176

**SUMMARY OF ACTIVE SECONDARY RECOVERY PROJECTS  
(DATE EFFECTIVE TO JANUARY 1, 1967)**

Field, Formation	Operator	Type or Project	Injection Pattern	Date Injections Commenced	Cumulative Injections 1000's Bbls. or MMCF	Dec. 1966 Avg. Daily Injection Rate	No. of Injection Wells	Source of Injection Media & Remarks
Ash Creek, Shannon	McDermott	Waterflood	Periphial	10-15-64	246	308	4	Parkman, Data for Montana portion.
Big Mall, Tyler B	Texaco, Inc.	"	Modified Periphial	8-20-66	735	5,662	3	Produced water from Amstden & Tyler Mallion
Bowes, Sawtooth	Texaco, Inc.	"	Dispersed Pilot	5-23-61	1,440	2,077	5	
Cabin Creek, Siluro-Ordovician	Shell Oil	"	Modified Periphial	6-12-59	14,336	18,433	15	Produced Water & Fox Hills
Car Creek, 1st & 2nd CC (Unit 1)	Continental Oil	"	Periphial	10-10-62	4,468	3,793	4	Third Cat Creek
Car Creek, 1st & 2nd CC (Unit 2)	Continental Oil	"	Periphial	12-1-59	13,861	4,119	8	Third Cat Creek
Cut Bank, NE Unit, Cut Bank	Texaco, Inc.	"	5-Spot	9-2-63	4,659	6,573	39	
Cut Bank, NW Unit, Cut Bank	Humble Oil	"	5-Spot	1-10-62	5,661	6,229	32	
Cut Bank, So. - Central, Cut Bank	Union Oil	"	5-Spot	5-63	7,570	4,568	27	
Cut Bank, SE Unit, Cut Bank	Texaco, Inc.	"	5-Spot	4-62	10,585	11,259	47	
Cut Bank, SW Unit, Cut Bank	Phillips Petr.	"	5-Spot	9-62	4,798	6,034	27	
Cut Bank, Tribal, Lander	Humble	"	Dispersed	6-51	4,173	382	4	Eagle
Cut Bank, H. C. Lander, Lander	Humble Oil	"	Dispersed	4-55	303	483	2	Eagle
Cut Bank, Lander Sand, Lander	Texaco, Inc.	"	Dispersed	7-64	1,008	1,271	7	Eagle
Cut Bank, McGuinness-Houlton	Union Oil	"	Dispersed	12-62	1,152	1,115	2	Madison
Cut Bank, SW Ext., Cut Bank	Continental Oil	"	One Well Pilot	12-63	288	184	1	Madison
Elk Basin, Frontier	Pan American Gas, Inc.	Crestal	"	1926	All injection wells in Wyoming			
Elk Basin, Embarr-Tensleep	Pan American Gas Inj.	Crestal	"	1949	All injection wells in Wyoming			
Elk Basin, Madison	Pan American Waterflood	Periphial	"	1962	14,571	4,320	4	Madison
Elk Basin, NW Unit, Frontier	Sinclair Oil	"	Periphial	10-57	3,443	1,501	4	Madison
Ivanhoe, Tyler	Ivanhoe Petr.	"	Dispersed Pilot	7-64	135	--	1	Atuvial Sands
Keg Coulee, West, Tyler B	Pan American	"	One Well Pilot	8-31-66	201	1,540	1	Madison
Kevin-Sunburst, Madison	Lon Crumley	"	Dispersed	9-53	226	202	1	Madison
Kevin-Sunburst, Madison	Texaco, Inc.	"	Periphial	8-64	1,408	1,484	11	Madison
Kevin-Sunburst, Madison	Juniper Oil	"	Dispersed	8-64	139	203	1	Madison
Kevin-Sunburst, Madison	Cardinal Petr.	"	Dispersed	6-65	137	414	2	Madison
Little Beaver, Siluro-Ord.	Shell Oil	"	Semi-Periphial	8-7-66	670	5,003	7	Minneusa
Little Beaver East, Siluro-Ord.	Shell Oil	"	Semi-Periphial	4-65	1,210	3,292	5	Minneusa
Mosby Dome, Madison	Musselshell Oil	"	One Well Pilot	12-65	26	--	1	Third Cat Creek
Pine, Siluro-Ordovician	Shell Oil	"	Semi-Periphial	3-59	30,218	19,430	31	Fox Hills & Produced Water
Pondera, Madison	Phillips Petr.	"	Dispersed	8-61	723	205	2	Madison
Ranged Point, Tyler A	Juniper Oil	"	Modified Periphial	2-3-66	886	2,526	5	Third Cat Creek
Reagan, Madison	Gas Inj.	Crestal	"	8-61	1,771	738	4	Produced Gas
Red Creek, Cut Bank	Waterflood	Humble	5-Spot	6-65	1,020	2,900	9	Madison
Richey Sw, Dawson Bay-Interlake	Sinclair	"	One Well Pilot	12-65	293	440	2	Fox Hills
Stensvad, Tyler B	Pan American	"	Periphial	2-63	5,837	6,673	5	Mission Canyon

**OIL AND GAS DISCOVERIES IN 1966**

County	Operator—Well Name and Location	Field	Total Depth	Initial Potential		Producing Formation
				Oil B/D	Gas (MCF)	
Carbon	Develop. Serv., Brown-Foothills 1, NW NW 4-6S-18E	Unnamed	2,610		700	Lakota (1)
Fallon	Shell Oil, NP 31X-5, NW NE 5-6N-60E	Lookout Butte	8,860	163 (P)		Lodgepole (2)
Glacier	Mont. Power, Frary-Scriver 1, C SW 1/4 18-37N-8W	Unnamed	4,725	4 (F)	300	Sun River
Glacier	Mont. Power, Elmer 1, NE NW 3-36N-5W	Cut Bank	3,070		2,000	Moulton (2)
Hill	Pan American, Lineweaver 1, NE NE 4-36N-8E	Unnamed	3,520		7,300	Piper
Liberty	Cardinal, State 15-8, SW SE 8-37N-5E	Flat Coulee	2,828			Dakota (2)
Musselshell	McAlester, NPPR 1, NE NE 13-10N-28E	Kelley	4,404	258 (F)		Tyler
Pondera	Balcon Oil, O'Brien 2, NW NE NW 13-27N-3W	Unnamed	1,989	6 (P)		Sunburst
Richland	J. A. Ihli, Magruder 1, SW NE NE 11-24N-55E	Unnamed	11,910	480 (F)		Red River
Roosevelt	Murphy Oil, White Mountain 1, N 1/2 NE 1/4 28-31N-48E	N. E. Benrud	7,801	60 (P)		Nisku
Sheridan	Chevron, Ferguson 1, NE SE 30-37N-58E	So. Flat Lake	6,640	67 (P)		Ratcliffe
Sheridan	Farmers Union, Aasheim 1, SW NE NE 29-33N-56E	Reserve	11,577		326 (F)	Interlake Red River
Toole	Wm. Fulton, McCutcheon 1, NE NE 16-36N-2E	Miner's Coulee	2,518	48 (P)	692 (F)	Sunburst
Toole	John Batts, State 13-16, SW SW 16-36N-3W	Rattlesnake Coulee	2,000	90 (P)		Sunburst
Toole	Wm. Fulton, State 31-23, SW SW 23-37N-4W	Unnamed	2,670		860	Cut Bank
Yellowstone	A. J. Hodges, Maart 1, NW NW 2-7N-31E	Weed Creek	6,300	288 (F)		Amsden

(1) Re-entry

(2) New Pool Discovery

(3) Dual Completion

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
<b>ARCH APEX</b> Blackleaf (Gas) (Crete.)	13	Strat.	Volumetric	(Blackleaf Gas Pool) 330' from legal subdivision; 2500' from any other drilling or producible gas well producing from the same reservoir; 75' topographic tolerance. (Order 4-60.)	None
<b>ASH CREEK</b> Shannon (Upper Cret.)	8	Anticline	Partial Water WaterDrive and Depletion	Spacing waived within unitized portion of field except no well may be drilled closer than 660' from unit boundary. (Order 4-65.)	Waterflood started in July, 1964
<b>BANNATYNE</b> Swift (Jurassic)	6	Anticline	Comb. Water Drive and Volumetric Water Drive	Center of 10-acre tracts, 50' topographic tolerance. Commingleng permitted. (Order 20-58.)	Pilot waterflood of Swift suspended in 1963.
Madison (Miss.)	3	Anticline	Depletion	State-wide. (Order 10-63.)	None
<b>BASCOM</b> Tyler (L. Penn.)	1	Structural	Depletion	State-wide. (Order 10-63.)	None
<b>BEARS DEN</b> Kootenai (L. Cret.)	6	Anticline	Depletion and Gas Cap Drive	State-wide.	None
<b>BELFRY</b> Fuson (L. Cret.)	1	Strat.	Depletion	State-wide. Abandoned 6-66.	None
<b>BENRUD</b> Nisku (Devonian)	1	Structural	Water Drive	(Nisku) 160-acre spacing units with permitted location within a 1320' square in center of quarter section. (Order 6-65.)	Water disposal into Judith River formation. (Order 64-62.)
<b>BENRUD, EAST</b> Nisku (Devonian)	1	Structural	Water Drive	(Nisku) Same as Benrud Field. (Order 6-65.)	None
<b>BENRUD, NORTHEAST</b> Nisku (Devonian)	2	Structural	Water Drive	(Nisku) Same as Benrud Field. (Order 6-65.)	None
<b>BEDTHELOTE</b> Sunburst (L. Cret.)	1	Strat.	Depletion	(Sunburst) 40-acre spacing units with well no closer than 330' from a lease or property line and not closer than 660' between wells. (Order 18-66.)	None
<b>BIG COULEE</b> 3rd Cat Creek (L. Cret.)	3	Structural	Water Drive	State-wide.	None
Morrison (U. Jur.)	3	Structural	Water Drive		
<b>BIG WALL</b> Amsden (Penn.)	7	Structural	Water Drive	Amsden & Basal Amsden (Tyler) spaced by old state-wide spacing; 330' from lease or property line, 990' between wells in same reservoir. (Order 12-54.)	Previous disposal into Tyler stopped in 1961. Waterflood of Tyler started August, 1966.
<b>BLACKFOOT</b> Cut Bank (L. Cret.)	17	Strat.	Depletion		
Madison (Miss.)	5	Strat.	Depletion	(Cut Bank and Madison). One well only per 40-acre spacing unit, 300' tolerance from center of spacing unit. Dual completion in Cut Bank & Madison with administrative approval.	None
	7	Structural	Water Drive		

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules		Secondary Recovery of Water Disposal
				Depletion	Depletion	
<b>BLACKFOOT, EAST</b> Cut Bank (L. Cret.)	1	Strat.	Depletion	(Cut Bank.) 40-acre spacing units. Location no closer than 330' from spacing unit boundary. (Order 41-65.)	None	
<b>BORDER</b> Cut Bank (L. Cret.) Moulton (L. Cret.)	6	Strat.	Depletion	(Moulton, Sunburst & Cut Bank) Oil: 220' from boundary of legal subdivision & 430' between wells in same formation; 75' topographic tolerance. Gas: 330' from boundary of legal subdivision. 2400' between wells in same formation on same lease. 75' topographic tolerance. (Order 7-54.)	None	
<b>BOWDOIN</b> (Gas) Bowdoin & Phillips sands in Colorado (Cret.)	349	Structural	Volumetric	(Gas only.) One well per quarter section not less than 1000' from lease boundary or less than 2000' from any gas well in same horizon. (Order 29-55.)	None	
<b>BOWES</b> Eagle (U. Cret.) (Gas)	21	Structural	Volumetric	(Eagle & Virgelle) (Gas) 660' from boundary of legal subdivision, 1320' from other wells in same formation. 75' topographic tolerance. (Order 23-54.) (Sawtooth.) 330' from lease or property line, 990' between wells in same formation. (Order 13-54.)	None	
Sawtooth (Jurassic)	59	Structural	Partial Water Drive			
<b>BRADY</b> Sunburst (L. Cret.)	5	Strat.	Depletion	(Brady Sand Pool.) 10-acre spacing units with 75' topographic tolerance from center of spacing unit. (Order 34-62.)	None	
<b>CABIN CREEK</b> Mission Canyon (Miss.) Interlake (Silurian) Red River (Ordovician)	19 82	Structural Structural	Water Drive Depletion	Spacing waived and General Rules No. 213 (Deviation), 218 (Commingling), and 219 (Dual Completion) are suspended until present Unit Agreement becomes operative. (Order 36-62.)	Waterflood of Siluro-Ordovician reservoir has been expanded to a full scale peripheral flood. Some produced water not used in waterflood is disposed into Mission Canyon. (Order 60-62.)	
<b>CAT CREEK</b> Kootenai (L. Cret.) Morrison (U. Jur.) Ellis (U. Jur.)	93 7 45	Structural Structural Structural	Depletion Depletion Depletion	(Kootenai, Morrison & Ellis) 220' from lease or property line, 440' from every other well in same formation. (Order 17-55.)	Two waterflood units are operating in the West Dome. In Mosby Dome one small pilot waterflood is in progress and another waterflood was approved in 1966.	
<b>CEDAR CREEK</b> Judith River (Gas)	176	Structural	Volumetric	(Judith River) Gas: 1200' from legal subdivision line, 2400' from every other well in same formation. (Order 33-54.) (Eagle.) 320-acre spacing units. Wells in center of NW $\frac{1}{4}$ and SE $\frac{1}{4}$ of each section with 200' topographic tolerance. (Order 1-61.)	None	
<b>CONRAD, SOUTH</b> Dakota (L. Cret.)	7	Strat.	Depletion	(Dakota) 10-acre spacing units. Wells in center of each unit with 75' topographic tolerance. (Orders 34-62 & 31-63.)	None	

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
<b>CUPTON</b> Red River (Ordovician)	1	Structural	Water Drive	(Red River) 80-acre spacing units consisting of E 1/2 & W 1/2 of quarter section; well location in SE 1/4 & NW 1/4 of quarter section with 75' topographic tolerance. (Order 31-55.)	None
<b>CUT BANK</b> Kootenai (L. Cret.) Madison (Miss.)	1,139	Strat.	Depletion	(Moulton, Sunburst, Cut Bank, Madison) Oil: 330' from legal subdivision line, 650' between wells in same formation, 5-spot on 40-acre tract permitted. 75' topographic tolerance. (Order 10-54.) Gas: 330' from legal subdivision, 2400' between wells in same formation. 75' topographic tolerance. (Order 10-54.)	There are 10 Kootenai sand waterfloods in progress.
<b>DEER CREEK</b> Interlake (Silurian) Red River (Ordovician)	2	Structural	Water Drive	(Interlake and Red River) 80-acre spacing units consisting of any two adjacent quarter-quarter sections. Well location in NE 1/4 and SW 1/4 of each quarter section with 75' topographic tolerance. (Orders 23-55 & 14-59.) Commingling of production permitted upon approval of Comm. Petr. Engr. (Order 18-63.)	Excess produced water is disposed into Dakota and Lakota formations. (Orders 6-56 & 3-58.)
<b>DELPHIA</b> Amsden (Penn.)	1	Structural	Water Drive	State-wide	None
<b>DEVILS BASIN</b> Heath (U. Miss.)		Shut-in	Structural	State-wide	None
<b>DEVON</b> (Gas) Blackleaf (L. Cret.)		Shut-in	Strat.	Volumetric	None
<b>DRY CREEK</b> Frontier (U. Cret.) (Gas)	1	Structural	Volumetric	State-wide spacing.	None
Eagle (L. Cret.) (Gas)	1	Structural	Volumetric		
Greybull (L. Cret.) (Gas)	1	Structural	Volumetric		
Greybull (Cret.) (Oil)	11	Structural	Depletion		
<b>DWYER</b> Mission Canyon (Miss.)	15	Structural	Water Drive	(Madison) 160-acre spacing units; well location in SE 1/4 of spacing unit with 75' topographic tolerance. (Orders 25-60, 29-61.)	Produced water disposed into Dakota formation. (Order 26-63.)
<b>ELK BASIN</b> (Mont. Portion) Frontier (U. Cret.)	5	Structural	Gravity Drainage	Rule No. 203 (Spacing) is waived within Unit Area. (Order 10-61.)	Frontier: Crestal gas injection.
Embar-Tensleep (Perm., Penn.)	26	Structural	Gravity Drainage		Embar-Tensleep: Pressure maintenance by crestal gas injection. Waterflood approved in 1966.
Madison (Miss.)	23	Structural	Water Drive		Madison: Water injection.
Jefferson (Dev.)	1	Structural	Water Drive		Jefferson: None.
<b>ELK BASIN, NORTHWEST</b> Frontier (U. Cret.)	8	Structural	Depletion	Spacing waived within unitized portion except that bottom of hole be no closer than 330' from unit boundary and there be at least 1,320' surface distance between wells in same formation; 75' topographic tolerance. (Orders 43-63, 28-64.)	Frontier: Waterflood in progress.
Embar-Tensleep (Perm., Penn.)	6	Structural	Gravity Drainage		Embar-Tensleep: Waterflood project approved in January, 1967.
Madison (Miss.)	2	Structural	Water Drive		Madison: None.

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
<b>FAIRVIEW</b> Red River (Ordovician)	2	Structural	Water Drive	(Red River) 160-acre spacing unit. Well location anywhere in spacing unit but no closer than 660' from unit boundary. (Orders 48-65, 1-67.)	None
<b>FERTILE PRAIRIE</b> Red River (Ordovician)	3	Structural	Water Drive	(Red River) 80-acre spacing units consisting of north-south rectangular units. Well location in NW $\frac{1}{4}$ and SE $\frac{1}{4}$ of quarter section with 75' topographic tolerance. (Orders 3-56, 7-62.)	None
<b>FLAT COULEE</b> Bow Island (Cret.) (Gas)	4	Structural and Strat.	Depletion	(Bow Island) Gas: 330' from boundary of legal subdivision and 1320' from other wells in same reservoir. (Order 16-55.)	None
Dakota (Cret.) (Gas)	1	Structural and Strat.	Depletion	(Dakota) State-wide.	
Swift (Jur.) (Gas)		Shut-in	Depletion	(Swift) Gas: State-wide gas spacing.	
Swift (Jur.) (Oil)	33	Structural and Strat.	Depletion	(Swift) Oil: 40-acre spacing units. Well in center of spacing unit with 150' topographic tolerance. (Orders 16-62, 19-63.)	
<b>FLAT LAKE</b> Madison-Ratcliffe (Miss.)	54	Structural and Strat.	Partial Water Drive	(Ratcliffe) 160-acre spacing units; well location in center of NE $\frac{1}{4}$ of quarter section with 200' topographic tolerance. Wells no closer than 961' to No. Dakota state line and no closer than 1600' to Canadian line. (Orders 10-65 amended and 43-65.)	Excess produced water disposed into Muddy, Dakota, or Lakota formations. (Orders 39 - 64, 39-66.)
<b>FLAT LAKE, SOUTH</b> Madison-Ratcliffe (Miss.)	1	Structural and Strat.	Partial Water Drive	(Ratcliffe) Same as Flat Lake spacing. (Order 2-67.)	None
<b>FRANNIE</b> (Mont. Portion) Tensleep (Penn.)	2	Structural	Comb. Water Drive and Gravity Drainage	(Tensleep) 10-acre spacing units; well location in center of each unit with 100' topographic tolerance. (Order 35-63.)	None
<b>FRED &amp; GEORGE CREEK</b> Sunburst (L. Cret.)	22	Strat.	Depletion	(Sunburst) Oil: 40-acre spacing units; well location in center of unit with 250' topographic tolerance. (Orders 29-63, 1-65.)	None
Swift (U. Jur.)	17	Strat.	Depletion	(Swift) State-wide.	
<b>GAGE</b> Madison (Miss.)	1	Structural	Water Drive	State-wide.	None
<b>GAGE, SOUTHWEST</b> Amsden (Penn.)	1	Unknown	Water Drive	Temporary 160-acre spacing expired. State-wide spacing now applies. (Order 50-65.)	None
<b>GAS CITY</b> Red River (Ordovician)	28	Structural	Water Drive	80-acre spacing units consisting of E $\frac{1}{2}$ and W $\frac{1}{2}$ of quarter sections; well location in NW $\frac{1}{4}$ and SE $\frac{1}{4}$ of quarter section; 150' topographic tolerance. Spacing waived and state-wide rules 213 (Deviation), 218 (Commingling) and 219 (Dual Completion) are waived in unitzied portion of field. (Order 29-62.)	Excess produced water disposed into Judith River formation and into Red River formation below oil-water contact. (Orders 32-61, 20-64.)

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
<b>GLENDIVE</b> Stony Mountain, Red River (Ordovician)	12	Strat. and Structural	Water Drive	(Stony Mountain, Red River) 80-acre spacing units consisting of two adjacent quarter-quarter sections; wells located in center of NE $\frac{1}{4}$ and SW $\frac{1}{4}$ of each quarter section with 75' topographic tolerance. (Orders 27-55, 19-62, 58-62, 20-66.)	Excess produced water disposed into Swift formation. (Orders 16-56, 16-63.)
<b>GOOSE LAKE</b> Ratcliffe (Miss.)	23	Structural and Strat.	Partial Water Drive	(Ratcliffe) 160-acre spacing units; well locations according to areas: Area I, center of NW $\frac{1}{4}$ of quarter section; Area II, center of SE $\frac{1}{4}$ of quarter section; Area III, center of NE $\frac{1}{4}$ of quarter section. 200' topographic tolerance. (Orders 42-63, 40-66.)	Excess produced water disposed into Lakota, Mission Canyon, Dakota, and Muddy formations. (Orders 12-64, 14-66.)
<b>GRABEN COULEE</b> Sunburst (L. Cret.)	0	Structural and Strat.	Depletion	(Sunburst) Oil: 40-acre spacing units; well location no closer than 330' from legal subdivision. (Cut Bank and Madison) Oil: 330' from boundary of legal subdivision and 650' from other well in same reservoir and on same lease. 75' topographic tolerance. (Order 73-62.)	None
Cut Bank (L. Cret.)	20	Structural and Strat.	Depletion		
Madison (Miss.)	22	Structural and Strat.	Depletion		
<b>GRANDVIEW</b> Blackleaf (Cret.) (Gas)	Shut-in 2	Structural	Unknown	State-wide spacing. State-wide spacing.	None None
Swift (U. Jur.)		Structural	Unknown		
<b>GYPSY BASIN</b> Sunburst (L. Cret.)	3	Structural and Strat.	Comb. Water Drive and Depletion	(Sunburst) Oil: 330' from lease lines and 660' between wells in same formation. Only two wells per quarter-quarter section. (Order 7-66.)	Order 6-64 permits injection of excessive gas (produced with oil) into the Sunburst gas cap.
Swift (U. Jur.)	1	Structural and Strat.	Comb. Water Drive and Depletion	(Swift) Oil: Same as Sunburst.	
Sawtooth-Madison (Jur. & Miss.)	5	Structural and Strat.	Comb. Water Drive and Depletion	(Sawtooth-Madison) Oil: 40-acre spacing units; wells no closer than 330' from lease line. (Order 7-66.) (Sunburst and Madison) Gas: 160-acre spacing units; well locations in center of any quarter-quarter section in each 160-acre unit; 2340' between gas wells. 150' topographic tolerance. (Order 13-59.)	
<b>HARDIN</b> Frontier (Cret.)	38	Strat.	Volumetric	State-wide.	None
<b>HIBBARD</b> Amsden (Penn.)	1	Unknown	Water Drive	State-wide.	None
<b>IVANHOE</b> Morrison (U. Jur.)	1	Structural and Strat.	Depletion	40-acre spacing unit for production from any one common formation; well location in center of unit with 200' topographic tolerance. (Order 7-60.)	Waterflood of Tyler B & C sands was started in July, 1964. (Order 19-64.)
Amsden (L. Penn.)	2	Structural and Strat.	Water Drive		
Tyler (L. Penn.)	9	Structural and Strat.	Depletion		
<b>KEG COULEE</b> Tyler (Penn.)	21	Strat.	Depletion	(Tyler) 40-acre spacing in southwest portion of field except that spacing is waived in unithized portion. (Orders 3-64, 4-64, 23-64.) 80-acre spacing in remainder of field with variable pattern. (Orders 11-60, 28-62.) Topographic tolerance varies from 100' to 150'. (Orders 11-60, 4-64, 23-64.) Buffer zone waived. (Order 16-65.)	A waterflood of Tyler C sand in the unithized northwest portion of the field was commenced in August, 1967. (Orders 3-64, 28-66.)

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
<b>KEG COULEE, NORTH</b> Tyler "B" (Penn.)	3	Strat.	Depletion	40-acre spacing units; well location in center of spacing unit with 150' topographic tolerance. (Order 46-64.) Buffer zone waived. (Order 16-65.)	None
<b>KEITH, EAST</b> (Gas) Blackleaf & Sawtooth (Gas) (Cret. & Jur.)	12	Structural	Water Drive	(Blackleaf & Sawtooth) State-wide gas spacing except in unitized portions that were spaced by Order 22-62.	None
<b>KELLEY</b> Tyler (Penn.)	2	Strat.	Depletion		None
<b>KEVIN-SUNBURST</b> Madison, Sunburst (Miss., L. Cret.)	729	Strat.	Depletion	9 wells per 40-acre tract; only 3 wells on any side of tract set back at least 220' from line. Field delineated by Orders 8-54, 28-55.	There are four waterfloods in operation.
<b>LAKE BASIN, NORTH</b> Eagle, Frontier (Cret.)	4	Structural	Unknown	(Frontier, Eagle) Gas: 640-acre gas spacing units consisting of one section. Well locations in center of NW $\frac{1}{4}$ or SE $\frac{1}{4}$ of each section with 75' topographic tolerance. (Order 6-58.)	None
<b>LITTLE BEAVER</b> (Mont. Portion) Red River (Ordovician)	30	Structural	Comb. Depletion and Water Drive	Spacing waived and General Rules No. 213 (Deviation), 218 (Commingling) and 219 (Dual Completion) are suspended until present Unit Agreement becomes inoperative. (Order 41-62.)	Waterflood of the Red River was commenced in August, 1967.
<b>LITTLE BEAVER, EAST</b> (Mont. Portion) Red River (Ordovician)	13	Structural	Comb. Depletion and Water Drive	Same as for Little Beaver. (Order 42-62.)	Waterflood of the Red River was commenced in April, 1965.
<b>LOGGE GRASS</b> Teensleep (Penn.)	3	Structural	Water Drive	(Tensleep) 160-acre spacing units; well locations vary according to areas; 250' topographic tolerance. (Orders 26-64, 26-65.)	None
<b>LOOKOUT BUTTE</b> Madison (Miss.) Silurian (Ordovician)	12	Structural	Water Drive Comb. Depletion and Water Drive	(Madison) State-wide spacing. (Silurian-Ordovician) 160-acre spacing; well location in center of SE $\frac{1}{4}$ of each quarter section with 150' topographic tolerance. (Order 21-62.) Coral Creek Unit not subject to spacing rules, Re-delineated per order 7-63.	Water disposal into Madison. (Order 68-62.) Waterflood of Silurian - Ordovician in Coral Creek Unit approved in 1966. (Order 35-66.)
<b>MASON LAKE</b> Lakota (Cret.)	2	Structural	Water Drive	State-wide.	None
<b>MELSTONE</b> Tyler (Penn.)	5	Structural and Strat.	Depletion	State-wide.	None
<b>MIDDLE BUTTE</b> Blackleaf (Cret.) (Gas)	4	Structural	Volumetric	(Bow Island) Gas: 320-acre spacing units consisting of E $\frac{1}{2}$ & W $\frac{1}{2}$ of each section, well location in center of either of the inside quarter-quarter sections located in E $\frac{1}{2}$ of each spacing unit. 75' topographic tolerance. (Order 3-66.)	None

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
<b>MINERAL BENCH</b> Charles "C" Duperow (Miss. & Dev.)	1	Structural	Water Drive	State-wide spacing.	Water disposal into Dakota-Lakota per Order 18-65.
<b>MINERS COULEE</b> Swift (U. Jur.)	6	Strat.	Depletion	(Sunburst-Swift) 40-acre spacing units consisting of quarter-quarter sections; well location no closer than 330' from lease or property line and 660' from any other well.	None
<b>MONARCH</b> Madison (Miss.)	2	Structural and Strat.	Water Drive	(Madison) 80-acre spacing units consisting of east and west halves of quarter section. Well location in SW $\frac{1}{4}$ & NE $\frac{1}{4}$ of quarter section. Location with 660' square at center of quarter-quarter section. (Order 18-61.) (Siluro-Ordovician) 160-acre spacing units consisting of a quarter section; well location in center of SW $\frac{1}{4}$ of quarter section with 175' topographic tolerance. (Orders 12-59, 4-63.)	Produced water is disposed into the salt water disposal system for the Pennel Field.
Interlake, Red River (Silurian, Ordovician)	11	Structural and Strat.			
<b>MOSSE</b> Dakota (L. Cret.)	9 /	Structural	Water Drive	Spacing waived. Future development requires administrative approval of the Commission. (Order 27-62.)	None
<b>MT. LILLY</b> Madison (Miss.) (Gas)	2	Structural	Water Drive	(Madison) Gas: 640-acre, well location in approximate center of any of the four quarter-quarter sections adjoining center of section; 250' topographic tolerance. (Order 37-63.)	None
<b>OUTLOOK</b> Duperow (Dev.)	2	Strat. and Structural	Water Drive	(Duperow) State-wide spacing.	
Silurian-Devonian	9	Strat. and Structural	Water Drive	(Winnipegosis & Interlake) 160-acre spacing units; well location in center of either SW $\frac{1}{4}$ or NE $\frac{1}{4}$ of each quarter section; 175' topographic tolerance. (Order 19-59A.)	
<b>OUTLOOK, SOUTH</b> Winnipegosis (Dev.)	2	Structural	Water Drive	(Red River & Interlake-Winnipegosis) 160-acre spacing; permitted wells in either SW $\frac{1}{4}$ or NE $\frac{1}{4}$ of quarter section; 175' topographic tolerance. (Order 19-59A.)	
Red River (Ordovician)	1	Structural	Water Drive		
<b>OUTLOOK, WEST</b> Winnipegosis (Dev.)	2	Structural	Water Drive	(Winnipegosis) 160-acre spacing units consisting of quarter sections; permitted wells in either SW $\frac{1}{4}$ or NE $\frac{1}{4}$ with a tolerance of 175'. (Order 7-67.)	
<b>PENNEL</b> Madison (Miss.)	8	Structural	Water Drive	(Madison) 80-acre spacing units consisting of east and west half of quarter section; wells located in center of SE $\frac{1}{4}$ and NW $\frac{1}{4}$ of quarter sections with 150' topographic tolerance. (Order 15-61.)	
Siluro-Ordovician	104	Structural	Comb. Depletion and Water Drive	(Siluro-Ordovician) 80-acre spacing units on west side and 160-acre spacing units on east side of pool. Wells to be located in SE $\frac{1}{4}$ and NW $\frac{1}{4}$ of each quarter section (80 acres) and in SE $\frac{1}{4}$ of each quarter section on 160-acre spacing. (Orders 1-56, 8-56, 15-61, 20-62, 4-63, 7-63.)	Produced water is being injected into Siluro-Ordovician, Dakota, and Madison formations. (Orders 16-60, 46-62, 68-62, 36-63, 13-64.)

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
<b>PINE</b> Silur-Ordovician	129	Structural	Comb. Depletion and Water Drive	Spacing and General Rules 213, 218 and 219 are waived within the Pine Unit. 80-acre spacing units outside of unit area; well location in NW $\frac{1}{4}$ and SE $\frac{1}{4}$ or quarter section; 150' topographic tolerance. (Order 37-62.)	A pressure maintenance program was started March 10, 1959, by injecting water into producing horizon. (Orders 13-58, 1-60, 8-62A.) Most of produced water is used in pressure maintenance. Some produced water is disposed into Dakota formation. (Order 7-58.)
<b>PLEVNA</b> Judith River, Eagle (Gas) (U. Cret.)	27	Structural	Water Drive	(Judith River, Eagle) Gas: 1200' from legal subdivision line; 2400' from other wells on same lease or unit; 75' topographic tolerance. (Order 3-54, 4-57.)	None
<b>POLE CREEK</b> Amsden (Penn.)	4	Structural	Water Drive	State-wide.	None
<b>MONDOR</b> Madison (Miss.)	314	Structural and Strat.	Comb. Depletion and Water Drive	(Ellis-Madison, Sawtooth) Oil: 220' from legal subdivision; 430' from other wells in same reservoir on same lease; 75' topographic tolerance. Porter Bench Extension: 330' from legal subdivision line; 650' from other wells in same reservoir on same lease or unit; 75' topographic tolerance. (Order 9-54.) Gas: 1320' from legal subdivision line; 3700' from other wells on same lease or unit; 75' topographic tolerance. (Order 9-54.) General Rules 207, 211, 219, 221, 223, and 224 do not apply.	Produced water injected into lower Madison. (Orders 11-56, 15-56, 4-65, 4-66.) A small waterflood project has been in operation since 1959.
<b>PONDER A COULEE</b> Madison (Miss.)	4	Structural	Water Drive	330' from legal subdivision lines or upon a 10-acre spacing pattern; 75' topographic tolerance. (Order 5-62.)	Excess produced water has been injected into the Dakota and Judith River formations. (Orders 1-55, 5-57, 7-57, 14-61, 21-61, 34-61, 10-62.)
<b>POPLAR</b> Madison (Miss.)	70	Structural	Water Drive	State-wide spacing; field delineated by Order 7-55.	None
<b>POPLAR, NORTHWEST</b> Madison (Miss.)	4	Structural	Water Drive	80-acre spacing units consisting of E $\frac{1}{2}$ and W $\frac{1}{2}$ of each quarter section; permitted wells in NW $\frac{1}{4}$ and SE $\frac{1}{4}$ of quarter section. 75' topographic tolerance. (Order 18-55.)	None
<b>RAIRIE ELK</b> Charles "C" (Miss.)	1	Unknown	Water Drive	State-wide spacing.	None
<b>RAGGED POINT</b> Tyler (Penn.)	13	Strat.	Depletion	Tyler: 40-acre spacing units; 75' topographic tolerance. (Order 8-59.) Spacing waived for Tyler "A" sand reservoir within Tyler "A" Sand Unit except no well can be closer than 660' to Unit boundary. (Order 35-65.)	A waterflood project of the Tyler "A" sand was commenced in February, 1966.
<b>KIBBEY</b> (Miss.)	1	Structural	Water Drive	Kibbey: State-wide spacing. (Order 15-54.) Commencing of production from Tyler and Kibbey permitted in one well per Order 11-65.	

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
<b>RANCH CREEK</b> Muddy (L. Cret.)	4	Unknown	Depletion	State-wide spacing.	None
<b>RATTLESNAKE COULEE</b> Sunburst (L. Cret.)	1	Strat.	Depletion	State-wide spacing.	None
<b>REAGAN</b> Madison (Miss.)	46	Structural	Comb. Gas Cap and Water Drive	State-wide spacing.	A pressure maintenance project utilizing gas injection was started in 1961. (Order 21-60.)
<b>RED CREEK</b> Cut Bank (L. Cret.) Madison (Miss.)	16 20	Strat. Structural	Depletion Water Drive	(Madison, Sunburst, & Cut Bank) 40-acre spacing units; well in center of spacing unit with 75' topographic tolerance; spacing waived for unitized portion. (Orders 16-58, 7-3-62, 31-64.)	Excess produced water injected into Bow Island and Madison. (Order 22-63, 37-64.) A waterflood project in the Cut Bank sand was initiated in June, 1965.
<b>REDSTONE</b> Winnipegosis (Dev.)	1 /	Unknown	Water Drive	State-wide spacing.	None
<b>REPEAT</b> Red River (Ordovician)	1	Unknown	Water Drive	State-wide spacing.	None
<b>RESERVE</b> Interlake, Red River (Silurian-Ordovician)	1	Unknown	Unknown	(Interlake, Red River) 160-acre spacing units; permitted well within 1320' square in center of quarter section. Commingling of Red River and Interlake production permitted on individual well basis. (Order 34-66.)	None
<b>RICHIEY</b> Charles (Miss.)	3	Structural	Water Drive	(Charles) 80-acre spacing units consisting of any two adjacent quarter-quarter sections; well locations in center of NW 1/4 and SE 1/4 of each quarter section; 75' topographic tolerance. (Order 21-55.)	Part of produced water is being injected into the Dakota formation. (Orders 10-58, 19-61.)
<b>RICHIEY, SOUTHWEST</b> Interlake, Dawson Bay	8	Structural	Depletion	(Devonian, Silurian, Ordovician) 160-acre spacing units; wells no closer than 900' from boundary of spacing unit. (Order 25-62.)	A waterflood project in the Interlake and Dawson Bay was started in 1965.
<b>RUDYARD</b> Sawtooth (Jurassic) (Gas)	3	Structural	Volumetric	(Sawtooth) Gas: 640-acre spacing units consisting of one section; well location in center of NW 1/4 of section with 75' topographic tolerance. (Order 2-58.)	None
<b>SAND CREEK</b> Interlake, Red River (Silurian, Ordovician)	8	Structural	Water Drive	(Interlake and Red River) 80-acre spacing units consisting of any two adjacent quarter-quarter sections. Wells located in center of NW 1/4 and SE 1/4 of each quarter section. (Order 16-59.) Commingling of production from Interlake and Red River authorized per Order 49-62.	Excess produced water is injected into the Swift formation. (Order 9-61.)
<b>SHOTGUN CREEK</b> Madison (Miss.)	1	Structural	Water Drive	State-wide spacing.	None

Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
<b>SIDNEY-BRORSON</b> Mission Canyon (Miss.)	2	Structural	Water Drive	(Madison) 320-acre spacing units consisting of one-half section which may be either the east and west or north and south halves. Well location in NW $\frac{1}{4}$ and SE $\frac{1}{4}$ of each section; tolerance area consists of the center 40 acres in the NW $\frac{1}{4}$ or SE $\frac{1}{4}$ of each section. (Orders 30-62, 12-63.)	None
<b>SNYDER</b> Tensleep (Penn.)	4	Structural	Water Drive	10-acre spacing units with center 5-spot permitted; 150' topographic tolerance. (Order 45-62.)	None
<b>SOAP CREEK</b> Tensleep, Amsden, Madison (Penn., Miss.)	15	Structural	Water Drive	One well per 10-acre spacing unit per production formation; well location in center of spacing unit with 75' topographic tolerance. (Order 26-60.)	None
<b>SPRING LAKE</b> Nisku (Dev.)	1	Structural	Depletion	(Nisku, Red River) One well per 160-acre spacing unit. Well location anywhere within 840' square in center of spacing unit. (Order 6-63.)	None
<b>STENSYARD</b> Tyler (Penn.)	2	Structural	Depletion	40-acre spacing units; well location in center of spacing unit with 200' tolerance. (Orders 2-59, 7-60.) Wells may be drilled anywhere within waterflood unit boundary, no closer than 660' from unit boundary. (Order 5-65 Amended.)	A waterflood operation has been in progress since 1963. (Orders 53-62, 9-67.)
<b>SUMATRA</b> Tyler (Penn.) Amsden (Penn.)	78	Strat. Strat. and Structural	Depletion Water Drive	40-acre spacing units; well located in center of unit with 75' tolerance. (Order 14-58.)	None
<b>TULE CREEK</b> Nisku (Dev.)	7	Structural	Water Drive	(Nisku) 160-acre spacing units with permitted well anywhere within 1320' square in center of each unit. (Orders 26-62, 6-65.)	Produced water injected into the Dakota formation.
<b>TULE CREEK, EAST</b> Nisku (Dev.)	2	Structural	Water Drive	(Nisku) 160-acre spacing units with permitted well anywhere within 1320' square in center of each unit. (Orders 40-46, 6-65.)	None
<b>TULE CREEK, SOUTH</b> Nisku (Dev.)	2	Structural	Water Drive	(Nisku) 160-acre spacing units with permitted well anywhere within a 1320' square in center of each unit.	Authority given to dispose of produced water into Judith River and Dakota. (Order 44-64.)
<b>UTOPIA</b> Sawtooth, Madison (Gas) (Jurassic, Miss.)	6	Structural	Unknown	State-wide gas spacing.	None
<b>VIDA</b> Interlake (Silurian)	2	Structural	Water Drive	(Interlake) 160-acre spacing units with permitted well anywhere within an 840' square in center of each unit. (Order 39-63.)	None

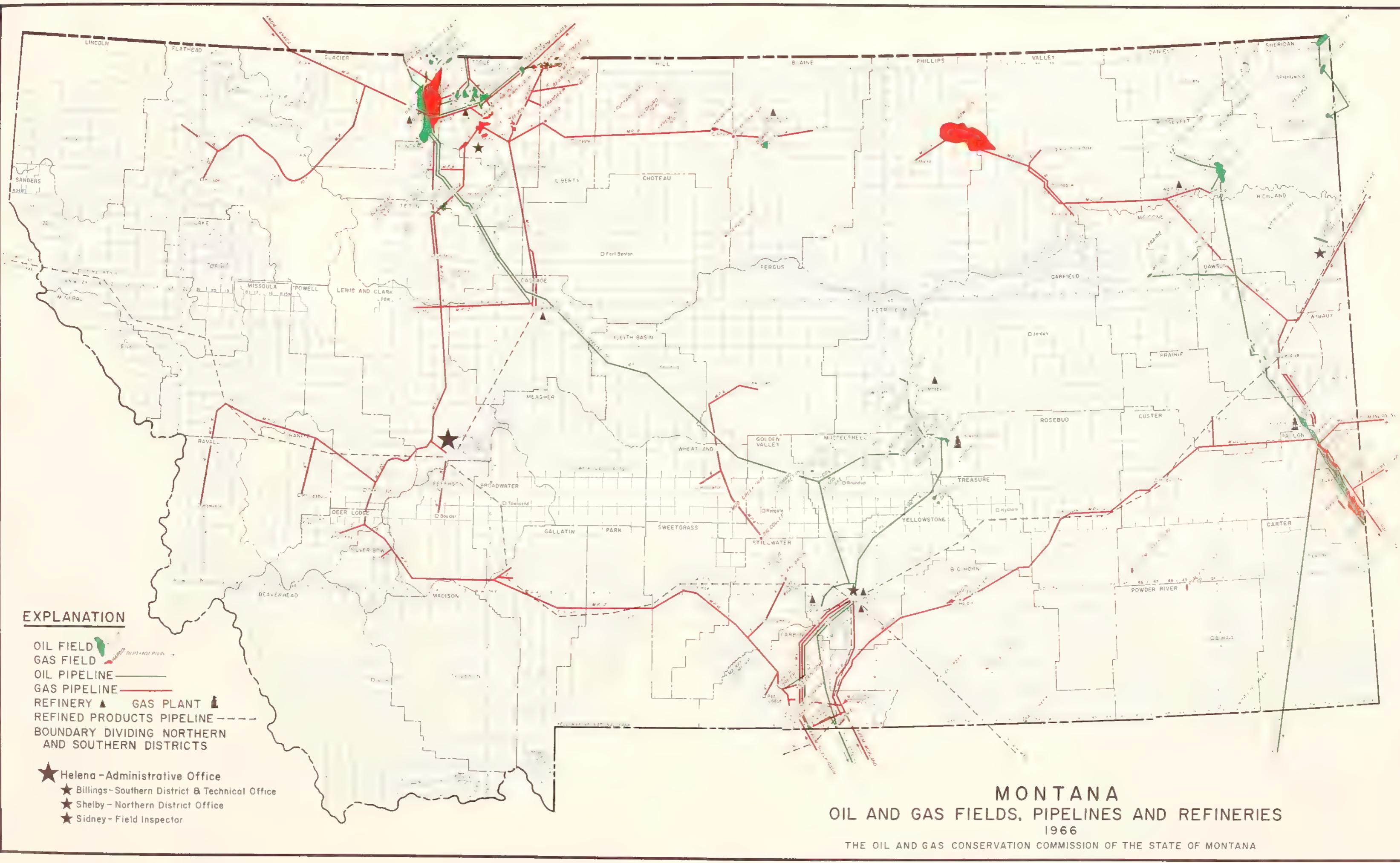
Field, Formation	No. Prod. Wells	Type of Trap	Probable Drive Mechanism	Spacing Regulations and Field Rules	Secondary Recovery or Water Disposal
<b>VOLT</b> Nisku (Dev.)	5	Structural	Water Drive	(Nisku) 160-acre spacing units with permitted well anywhere within a 1320' square in center of each unit. (Order 27-64, 6-65.) (Charles) State-wide spacing.	Excess produced water is disposed into Judith River. (Order 3-65.)
<b>CHARLES (Miss.)</b>	1	Structural	Water Drive	(Kibbey) 80-acre spacing unit; each quarter section divided into two separate units running in either a north-south or east-west direction; well location in center of NE 1/4 and SW 1/4 of quarter section with 200' topographic tolerance. (Order 9-65.)	Excess produced water is disposed into the Charles and Morrison formations. (Orders 31-65, 47-65, 37-66.)
<b>WELDON</b> Kibbey (Miss.)	18	Structural	Partial Water Drive		
<b>WHITLASH</b> Blackleaf, Kootenai, Swift (Cretaceous, Jurassic)	44	Comb. Strat. and Struct.	Volumetric	Gas: 330' from legal subdivision line and 2400' between wells; 75' topographic tolerance. Oil: 330' from legal subdivision line and 650' between wells; 5-spot location at center of 40-acre tract permitted; 75' topographic tolerance. General Rules 207, 211, 219, 221, 223, and 224 suspended. (Order 16-54.)	None
<b>WHITLASH, WEST</b> Sunburst, Swift (Cretaceous, Jurassic)	15	Structural and Strat.	Volumetric	Gas: 160-acre spacing units consisting of quarter sections; well location anywhere within a 660' square in center of spacing unit. Oil: 330' from legal subdivision line, 650' between wells in same reservoir on same lease; 5-spot location permitted. (Order 61-62.)	None
<b>WILLS CREEK, SOUTH</b> Siluro-Ordovician	2	Structural	Partial Water Drive	(Siluro-Ordovician) 160-acre spacing units. Well location in center of SE 1/4 of each unit with 175' topographic tolerance. (Orders 5-64, 30-66.)	None
<b>WOLF SPRINGS</b> Amsden (Penn.)	12	Structural	Water Drive	(Amsden) 80-acre spacing units consisting of N 1/2 and S 1/2 of each quarter section. Well location in center of NW 1/4 and SE 1/4 of each quarter section with 75' topographic tolerance. (Orders 4-56, 9-59.)	None
<b>WOODROW</b> Charles, Duperow, Interlake, Red River (Miss., Dev., Silurian, Ordovician)	5	Structural	Water Drive	80-acre spacing units consisting of any two adjacent quarter-quarter sections; well locations in center of NE 1/4 and SW 1/4 of each quarter section with 200' topographic tolerance. (Order 47-62.)	Produced water injected into Dakota. (Order 48-62.)



# STATE OF MONTANA — SUMMARY OF PRODUCING OIL FIELDS

LINE NO.	FIELD (OR POOL)	COUNTY	YEAR DISCOVERED	PRODUCTION FORMATION	APPROX. DEPTH	A.P.I. GRAVITY	VOLUME FACTOR	AVG. NET PAY FT.	AVG. CONNATE WATER %	ORIGINAL OIL IN PLACE BBLS./ACRE	PRODUCTIVE AREA 1-1-67 ACRES	ORIGINAL OIL IN PLACE 1000 BBLS.	ESTIMATED RECOVERY FACTOR %	ORIGINAL RESERVES 1000 BBLS.	TOTAL ORIGINAL RESERVES 1000 BBLS.	CUMULATIVE PRODUCTION 1-1-67 1000 BBLS.	REMAINING RESERVES 1-1-67 1000 BBLS.	1966 PRODUCTION		ORIGINAL RECOVERABLE RESERVES BBLS./ACRE FT.	LINE NO.				
																		PRIMARY	SECONDARY	PRIMARY	DAILY BOPD				
1	Ash Creek (Montana)	Big Horn	1952	Shannon (U. Cret.)	4500	34	1.05	14	22	42	13,199	200	2,640	25	31	660	158	818	526	292	72,609	199	4,090	292	1
2	Bannetyne	Teton	1927	Swift (U. Jur.)	1450	27	1.05	39	15	43	24,635	170	4,188	5	--	209	186	23	5,074	14	1,229	32	2		
3	Bears Den	Liberty	1924	Sunburst (L. Cret.)	2300	39	1.08	20	12	35	11,205	200	2,241	17	--	381	295	86	20,190	55	1,905	95	3		
4	Bennrud	Roosevelt	1961	Nisku (Dev.)	7650	43	1.41	22	16	30	13,557	80	1,085	20	--	217	217	79	29,084	80	2,713	123	4		
5	Bennrud, East	Roosevelt	1962	Nisku (Dev.)	7500	46	1.37	35	15	30	20,811	160	3,330	33	--	1,099	632	467	111,420	305	6,869	196	5		
6	Bennrud, Northeast	Roosevelt	1964	Nisku (Dev.)	7620	46	1.4	45	15.5	30	27,054	160	4,329	30	--	1,299	409	890	182,354	500	8,119	180	6		
7	Big Wall	Musselshell	1948	Tyler (Penn.)	3000	31	1.02	22	17	40	17,068	1,220	31	36	6,455	1,041	7,496	4,884	2,612	162,911	446	6,144	279	7	
8	Big Wall	Musselshell	1953	Amaden (Penn.)	2500	19	1.61	17	16	35	8,517	280	2,385	23	--	548	480	68	40,899	112	1,957	115	8		
9	Blackfoot	Glacier	1955	Madison (Miss.)	3550	25	1.15	8	14	40	4,533	480	2,176	32	--	696	--	1,023	818	205	725,438	1,988	1,450	181	9
10	Blackfoot	Glacier	1955	Cut Bank (L. Cret.)	3500	30	1.11	15	15	35	10,221	160	1,635	20	--	327	--	1,023	818	205	2,044	136	138	10	
11	Bowes	Blaine	1949	Sawtooth (M. Jur.)	3250	19	1.02	37	11.7	31	22,718	3,760	85,420	8	10	6,834	1,708	8,562	6,735	1,807	180,941	496	2,272	61	11
12	Brady	Pondera	1942	Sunburst (L. Cret.)	1500	34	1.01	10	12	30	6,452	140	903	7	--	63	35	28	3,001	8	450	45	12		
13	Cabin Creek	Fallon	1953	Siluro-Ordovician	8400	33	1.20	50	13	30	29,415	7,620	228,142	22	30	49,311	17,931	67,242	35,779	31,463	2,373,193	6,502	8,824	176	13
14	Cabin Creek	Fallon	1956	Mission Canyon (Miss.)	7300	33	1.13	25	11	30	13,215	2,259	29,853	35	--	10,449	--	10,449	5,830	4,619	725,438	1,988	4,625	185	14
15	Cat Creek (West Dome)	Petroleum	1920	Kootenai (L. Cret.)	1100	52	1.10	51	21	19	975	25	39	14,913	8,351	23,264	16,526	6,738	110,063	302	23,860	468	15		
16	Cat Creek (Antelope-Mosby)	Petroleum	1920	Garfield	1225	52	1.10	10	21	19	11,997	200	2,399	22	11	528	--	6,249	4,351	1,898	68,945	189	3,960	396	16
17	Cat Creek	Petroleum	1945	Garfield	1600	52	1.10	6	22	40	5,586	240	1,340	32	--	428	--	6,249	4,351	1,898	68,945	189	1,783	297	17
18	Cat Creek	Petroleum	1945	Garfield	1750	52	1.10	25	18	40	19,050	880	16,764	30	--	5,029	--	1,253	1,058	195	5,715	229	18		
19	Cut Bank	Glacier, Toolo	1932	Kootenai (L. Cret.)	2900	38	1.09	18	15	35	12,492	49,000	612,108	20	31	122,422	67,332	189,754	100,513	89,241	3,902,643	10,692	3,873	215	19
20	Cut Bank	Glacier, Toolo	1945	Glacier, Toolo	3000	39	1.10	10	14	30	6,911	3,200	22,115	28	--	6,192	--	6,192	5,484	708	135,908	1,935	1,935	20	
21	Deer Creek	Dawson	1952	Red River (U. Ord.)	9900	41	1.2	90	7	30	28,530	240	6,847	15	--	1,027	--	995	32	5,442	15	4,279	48	21	
22	Deer Creek	Dawson	1956	Interlake (Sil.)	9440	43	1.2	38	6.7	30	11,514	320	3,684	34	--	1,253	--	1,253	1,058	195	36,142	99	3,916	103	22
23	Dwyer	Sheridan	1960	Mission Canyon (Miss.)	8000	33	1.12	30	11.8	55	11,034	4,800	52,963	9	--	4,767	--	4,767	3,481	1,286	335,024	918	993	33	23
24	Elk Basin (Montana Portion)	Carbon	1915	Frontier (U. Cret.)	1200	45	1.16	30	21	30	33,720	120	4,046	--	33	1,335	--	1,335	1,296	39	1,265	11,125	371	24	
25	Elk Basin (Montana Portion)	Carbon	1942	Embar-Tensleep (Perm.-Penn.)	5000	29	1.16	124	10.5	10	78,368	1,376	107,834	--	57	61,465	41,814	19,651	2,141,308	5,867	44,669	360	25		
26	Elk Basin (Montana Portion)	Carbon	1946	Madison (Miss.)	5300	28	1.12	224	12	9	169,434	920	155,879	24	28	37,411	6,235	43,646	11,248	32,398	806,302	2,209	47,441	212	26
27	Elk Basin (Montana Portion)	Carbon	1963	Jefferson (Dev.)	5400	28	1.18	64	6.5	31	18,867	40	755	4	--	30	28	2	1,736	5	700	11	27		
28	Elk Basin, Northwest	Carbon	1947	Frontier (U. Cret.)	3375	47	1.29	28	19	30	22,394	120	2,687	25	--	672	564	1,236	1,020	216	35,070	96	10,300	368	28
29	Elk Basin, Northwest	Carbon	1947	Madison (Miss.)	6215	35	1.08	124	12	35	69,477	300	20,843	15	--	2,084	--	2,084	836	1,248	13,155	36	10,420	84	29
30	Elk Basin, Northwest	Carbon	1964	Embar-Tensleep (Perm.-Penn.)	6000	27	1.15	27	11.5	22	16,338	580	9,476	15	--	1,421	1,232	2,653</							







# GENERALIZED STRATIGRAPHIC CORRELATION CHART

## HOWING PRODUCING HORIZONS — MONTANA OIL AND GAS FIELDS, 1966

